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(54) **CONTROL KNOB USED FOR HOUSEHOLD APPLIANCES**

REGELKNOPF FÜR HAUSHALTGERÄTE

BOUTON DE COMMANDE POUR APPAREILS ELECTROMENAGERS

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Description

[0001] The present invention is related to a retractable rotary control knob used in all kinds of electrical household appliances, which protrudes from the control surface when pushed and which may be used for the operation of the components that are commanded by a turning or push-pull rod.

[0002] The knob is flush fitted to the control panel, i.e. it does not protrude from the surface in the system for aesthetic purposes as well as to prevent usage by children. In work position it projects from the panel level towards the direction wherein it is to be used and operates the component to which it is connected at the back of the panel by means of the turning rod.

[0003] The turning knob disclosed in the European Patent Application, No EP 9311 0933 describing a control knob according to the preamble of claim 1, consists of a push-pull type control mechanism or knob, an end piece to be connected with the said panel and another part to operate with the control device by being torsioned. This part co-operates with the control element and the said end piece is connected with a body (1) that is axially movable along said part against the action of a spring and cooperating torsionally therewith. The part cooperating with the control element is arranged movable relative to the longitudinal axis of the knob, within a cavity in the end part of the knob; there being provided with axial retention means preventing said member from escaping off the cavity while enabling it to undergo said movement.

[0004] In the European Patent Application No. EP 94103552, the rotary knob mounted on the external face of a household appliance, is integral with an axially slidable control shaft which is moved so that a linkage is provided within a seat.

[0005] A drive mechanism regulating the sliding motion and stopping of the shaft is provided between the housing and the control shaft. According to the invention a mark-bearer on which certain characteristics are marked and which slides and rotates and is at the first protruding work (ON) position and the second rest (OFF) position together with the shaft is provided.

[0006] The mechanism that enables the knob to protrude from the control panel surface, consists of at least four parts one of which is spring. These knobs are formed by a part providing the connection between the component being controlled by making a rotary movement through a cavity or pin connection; on this part, a housing (cavity) having a similar mechanism as that of a ball-point pen; the knob cap by which the users give rotary motion to the knob; and a spring between the cap and the part connected to the component, pushing the knob cover towards the intended direction of usage by means of a metal pin that can move inside the cavity of ball point pen.

[0007] The object of the invention is to realize a control knob by which the intended function is provided by

using less components as compared to other similar knob mechanisms and that protrudes outwards the control panel surface enough to enable easy-holding of the knob when pushed and that controls the component to which it is connected on the panel.

[0008] The control knob according to the invention is shown in the attached drawings, wherein;

[0009] Figure 1 is the axonometric view of the control knob in the protruded i.e. working position.

[0010] Figure 2 is the axonometric view of the control knob at the control panel level, i.e. rest position.

[0011] Figure 3, is the section of the control knob at the control panel level.

[0012] Figure 4, is the section of the control knob as protruded from the panel, ready to be controlled position.

[0013] Figure 5, is the section of the control knob as protruded from the panel showing the locking mechanism.

[0014] Figure 6, is the section of the control knob at the control panel level showing the locking mechanism.

[0015] The corresponding reference numbers of the components are as follows:

1) Knob cap

- 1a) Thin rib (leaf blade)
- 1b) Cylindrical pin at the end of the rib
- 1c) side surface of the knob cap

2) Knob housing part

- 2a) Plastic component coupling pin in the structure of knob housing part
- 2b) Housing in which the mechanism mover
- 2c) Retaining
- 2d) Humps (obstructions) preventing reversal motion
- 2e) Plain (flat) surface wherein the housing is.

3) Mechanism spring that provident the movement

4) Control panel surface

[0016] The control knob according to the invention consists of three parts, namely a knob cap (1) a knob housing part (2) and a spring (3) enabling the mechanism to move. The shape of knob housing (2) enables a part of it to operate as a component coupling pin (2a). The control knob is connected to the component that it controls by being inserted in it by means of this pin (2a) or by being wound around a pin of the component. When it is on the same level as the control panel surface i.e. at rest position, it is pushed forward in the direction of its rotary axis in order to bring it to a position ready to be controlled by causing it to project from the control panel.

[0017] The knob cap (1) has a housing on the knob housing part (2) connected to the rotor axis of the com-

ponent, that enables it to slide along the same axis thus providing its forward and backward movement. The internal structure of the section on the surface of the control panel level (4) of this housing may be in any geometric shape that enables the cap to transmit the rotary movement to the knob housing part (2) including the heart shaped mechanism movement space on one side and the knob cap. This spring applies a constant pressure on the knob cap (1) so that the latter protrudes from the control panel surface (4).

[0018] A reduction in the number of parts is provided by producing and using the pin (1b) as monobloc with the plastic structure used for the cap whereas it is used as a separate element in similar applications.

[0019] This cylindrical pin (1b) is connected to the knob-cap (1) by means of its section in the form of a thin rib (1a). This section also has such structural characteristics as flexibility in a degree to enable it to complete its (1b) cycle inside the mechanism movement space (2b) as well as rigidity in a degree to enable it to withstand this motion repeated constantly without breaking.

[0020] During its axial sliding movement, the cylindrical pin (1b) at the end of the thin rib (1a) moves within the mechanism movement space (2b). The humps and obstructions (2d) formed in this space prevents the reversal motion of the cylindrical pin (1b) and provides a one-directional movement.

[0021] Restraining lugs (2c) are used at the plain surface where the movement space (2b) is and at the end point of the opposing surface in order to prevent the escape of the cylindrical pin (1b) from the housing (2b) by the pushing force of the spring and to provide the positioning of the knob-cap. (1) properly when it protrudes from the control panel surface. Instead of these retention lugs, notches that do not obstruct the axial or rotary movement may also be used.

[0022] Marking that positions and that are visible when at "ON" position, may be provided on the side surface (1c) of the knob-cap

Claims

1. A rotary control knob, protruding from the control panel surface to a holdable length at working position when pushed and controlling the component to which it is linked at the panel by means of a rotary shaft, **characterized in that** it consists of three components namely a knob cap (1) including a thin rib (1a) realised as leaf blade and a cylindrical pin (1b) and having a housing wherein the knob housing part (2) can be inserted, a knob housing part (2) consisting of a heart-shaped mechanism movement cavity (2b) on one side and a mechanism spring (3) placed between these two elements, providing the movement.

2. A control knob according to claim 1, **characterized**

in that the cylindrical pin (1b) operating inside the mechanism movement space (2b) and the thin rib (1a) providing the connection of the said pin (1b) with the cap (1) are integral parts of the plastic structure used for the cap and form a monobloc component together with the cap.

3. A control knob according to Claims 1 and 2, **characterized in that** retention lugs (2c) or notches that will not obstruct the axial or rotary movement are used on the plain surface (2e) where the movement space (2b) is provided and at the end point on the opposing surface in order to prevent the cylindrical pin (1b) from escaping off the housing (2b) due to the pushing force of the spring and to provide the proper positioning of the knob cap (1) when it is protruded from the control panel surface, i.e. at working position.

4. A control knob according to claims 1 to 3, **characterized in that** humps and obstructions are formed preventing the reversal movement of the cylindrical pin (1b) inside the mechanism movement space (2b) in order to enable it to complete its cycle within the said space (2b) by moving in one direction.

5. A control knob according to claims 1 to 4, **characterized in that** the pin (1b) may be in any geometrical structure.

6. A control knob according to claim 1, **characterized in that** the internal structure of the housing section on the control panel surface (4) plane of the knob-cap (1) is in any geometrical shape that enables the cap to transfer the rotary movement to the knob housing part (2) in the same ratio and to provide the axial sliding movement.

Patentansprüche

1. Drehbarer Steuerknopf, der in einer Arbeitsposition, in der er gedrückt ist, von einer Steuerkonso-
lenoberfläche um eine greifbare Länge vorsteht und
die Komponente, mit der er auf der Konsole mittels
einer Drehwelle verbunden ist, steuert, **dadurch
gekennzeichnet, daß** er aus drei Komponenten
besteht, nämlich einer Knopfkappe (1), die einen
als Blattklinge ausgeführten dünnen Steg (1a) und
einen zylindrischen Stift (1b) enthält und ein Gehä-
use besitzt, in die ein Knopfgehäuseteil (2) einge-
schoben werden kann, einem Knopfgehäuseteil (2),
das auf einer Seite aus einem herzförmigen Mecha-
nismus-Bewegungshohlraum (2b) besteht, und ei-
ner Mechanismusfeder (3), die zwischen diesen
beiden Elementen angeordnet ist und die Bewe-
gung ergibt.

2. Steuerknopf nach Anspruch 1, **dadurch gekennzeichnet, daß** der zylindrische Stift (16), der in dem Mechanismus-Bewegungsraum (2b) arbeitet, und der dünne Steg (1a), der die Verbindung des Stifts (1b) mit der Kappe (1) ergibt, einteilig mit einer Kunststoffstruktur ausgebildet sind, die für die Kappe verwendet wird, und zusammen mit der Kappe eine Einblockkomponente bilden. 5
3. Steuerknopf nach Anspruch 1 und 2, **dadurch gekennzeichnet, daß** auf der ebenen Oberfläche (2e), auf der der Bewegungsraum (2b) vorgesehen ist, und am Endpunkt der gegenüberliegenden Oberfläche Halteansätze (2c), oder -kerben, die die axiale oder rotatorische Bewegung nicht beeinträchtigen, verwendet werden, die verhindern, daß der zylindrische Stift (1 b) aufgrund der Schubkraft der Feder aus dem Gehäuse (2b) ausrückt, und die die richtige Positionierung der Knopfkappe (1) schaffen, wenn sie von der Steuerkonsolenoberfläche vorsteht, d. h. wenn sie sich in der Arbeitsposition befindet. 10
4. Steuerknopf nach den Ansprüchen 1 bis 3, **dadurch gekennzeichnet, daß** Höcker und Hindernisse ausgebildet sind, die die Rückwärtsbewegung des zylindrischen Stifts (1b) in dem Mechanismus-Bewegungsraum (2b) verhindern, um ihm zu ermöglichen, daß er seinen Zyklus in dem Raum (2b) durch Bewegen in einer Richtung abschließt. 25
5. Steuerknopf nach den Ansprüchen 1 bis 4, **dadurch gekennzeichnet, daß** der Stift (1b) irgendeine geometrische Struktur haben kann. 30
6. Steuerknopf nach Anspruch 1, **dadurch gekennzeichnet, daß** die innere Struktur des Gehäuseabschnitts auf der Konsolenoberflächen-Ebene (4) der Steuerkappe (1) irgendeine geometrische Form hat, die der Kappe ermöglicht, die Drehbewegung an das Knopfgehäuseteil (2) im gleichen Verhältnis zu übertragen und eine axiale Gleitbewegung zu schaffen. 35

Revendications

1. Un bouton de contrôle rotatif, dépassant de la surface d'un panneau de contrôle sur une longueur permettant de le saisir, en position active, quand il est poussé, et qui contrôle le composant auquel il est relié sur le panneau par l'intermédiaire d'un arbre rotatif, **caractérisé en ce qu'il** consiste en trois composants, à savoir une calotte (1) comportant une mince nervure (1a) réalisée sous forme de feuille d'aube et une cheville cylindrique (1b) et créant un logement dans lequel peut être inséré le boîtier du bouton, un boîtier de bouton (2) consis-

tant en une cavité (2b) permettant le mouvement d'un mécanisme en forme de coeur sur un côté et un ressort (3) pour ce mécanisme, placé entre ces deux éléments et assurant ce mouvement.

2. Un bouton de contrôle selon la revendication 1, **caractérisé en ce que** la cheville cylindrique (16) fonctionnant à l'intérieur de l'espace pour le mouvement du mécanisme (2b) et la nervure mince (1a) assurant la liaison de ladite cheville (1b) avec ladite calotte (1) sont en une seule pièce avec la structure en matière plastique utilisée pour la calotte et forme un composant monobloc ensemble avec la calotte. 10
3. Un bouton de contrôle selon les revendications 1 et 2, **caractérisé en ce que** des pattes de rétention (2c) ou des encoches qui ne gênent pas le mouvement axial ou rotatif sont utilisés sur la surface libre (2e) où est créé l'espace pour le mouvement (2b), et à l'extrémité de la surface opposée, en vue d'empêcher la cheville cylindrique (1b) de s'échapper du boîtier (2b) sous la force de compression du ressort et d'assurer le positionnement approprié de la calotte du bouton (1) quand il dépasse de la surface du panneau de contrôle, c'est-à-dire en position active. 15
4. Un bouton de contrôle selon les revendications 1 à 3, **caractérisé en ce que** des bosses et des obstructions sont créées pour empêcher le mouvement inverse de la cheville cylindrique (1b) à l'intérieur de l'espace de mouvement du mécanisme (2b) en vue de lui permettre d'achever son cycle à l'intérieur dudit espace (2b) en se déplaçant dans une direction. 20
5. Un bouton de contrôle selon les revendications 1 à 4, **caractérisé en ce que** la cheville (1b) peut avoir n'importe quelle structure géométrique. 25
6. Un bouton de contrôle selon la revendication 1, **caractérisé en ce que** la structure interne de la section du boîtier situé sur le plan de la surface (4) du panneau de contrôle de la calotte du bouton (1) a n'importe quelle forme géométrique qui permette à la calotte de transmettre le mouvement rotatif au boîtier du bouton (2) dans le même rapport et d'assurer le mouvement de coulissement axial. 30

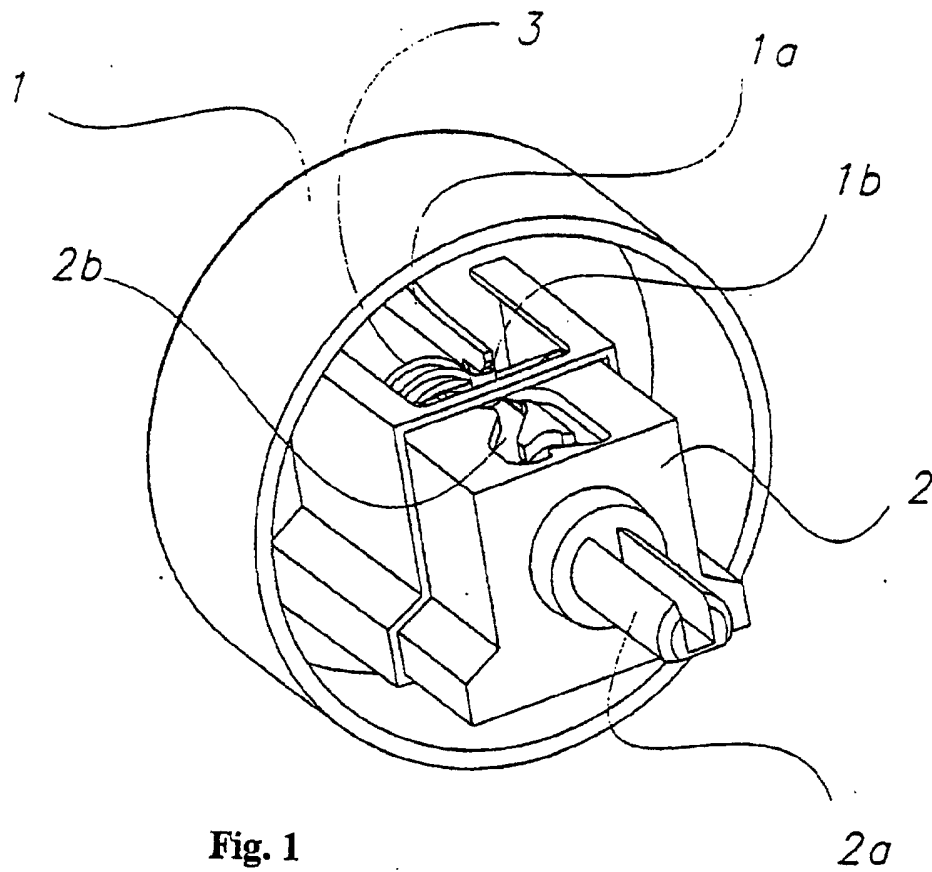
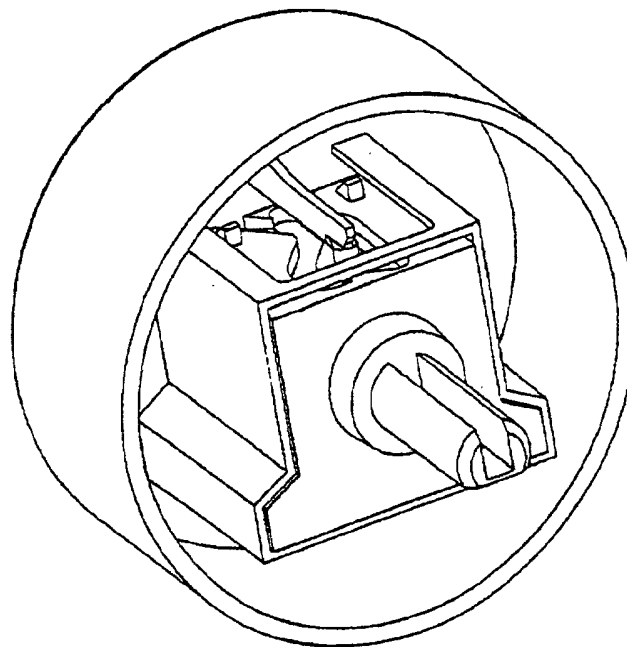


Fig. 2



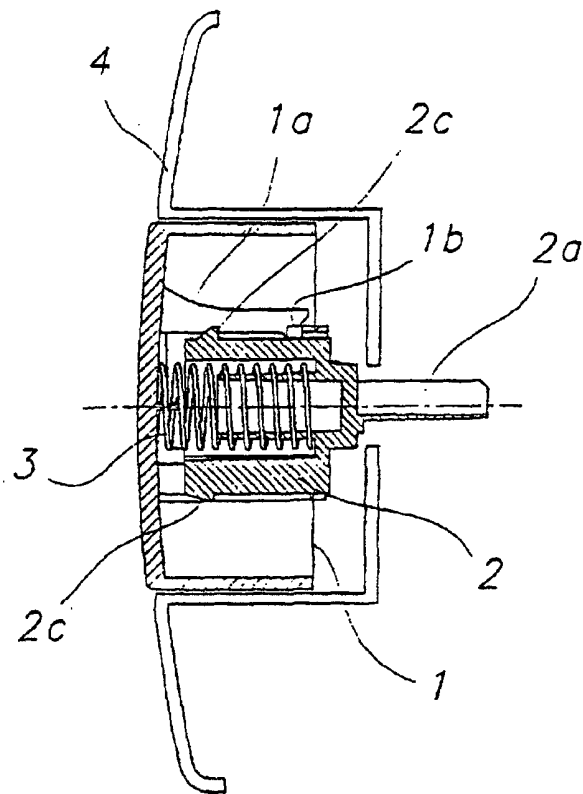


Fig. 3

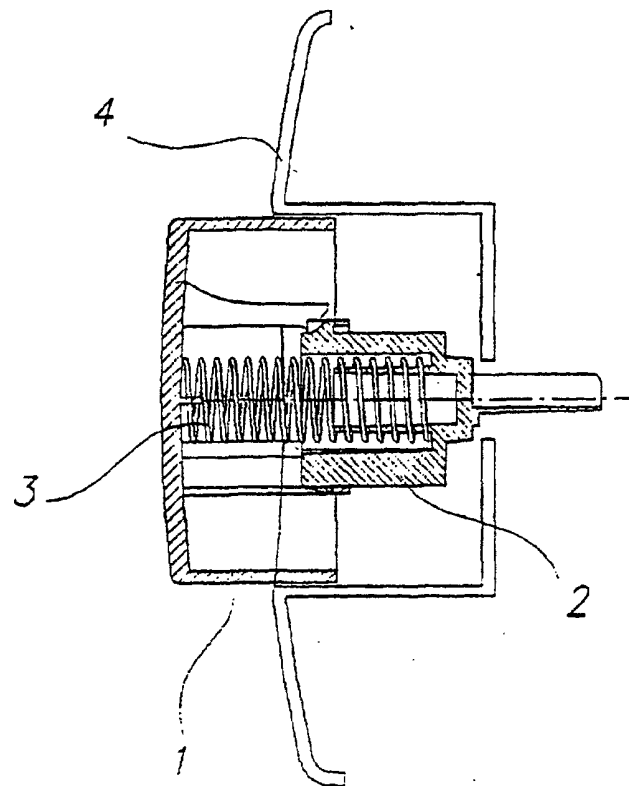


Fig. 4

